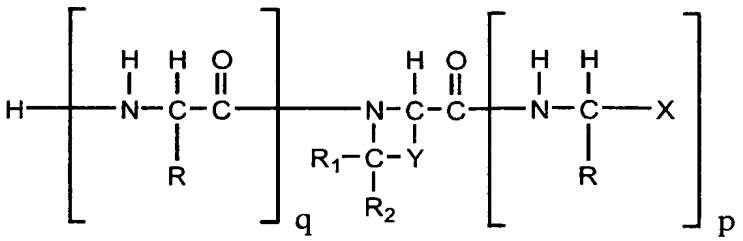
What is claimed is:

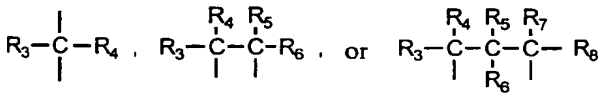
CLAIMS

1. A method for treating a medical disorder in a subject mediated by the alteration of substrate activity comprising administering to the subject an effective amount of a compound having the formula PR, wherein P represents a targeting moiety that binds to DPP-IV, and R represents a reactive group that reacts a reactive center of DPP-IV, said amount being sufficient to prevent chemokine alteration by inhibiting DPP-IV activity.

2. The method of claim 1 wherein the compound has the formula

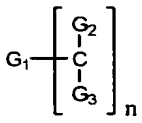


where H represents a hydrogen; C represents a carbon; O represents an oxygen; N represents a nitrogen; each R, independently, is chosen from the group consisting of the R groups of an amino acid, including proline; X represents any atom that forms a single bond with carbon; Y is



and each R_1, R_2, R_3, R_4, R_5, R_6, R_7, and R_8, separately is a group which does not significantly interfere with site specific recognition of the inhibitory compound by DPP-IV, and allows a complex to be formed with DPP-IV, each H represents that bond or a hydrogen; and q and p are integers which are independently varied between 0 and 4 inclusive.

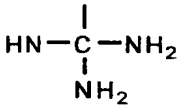
3. The method of claim 1 wherein the compound has the formula



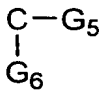
where n is between 0 and 3 inclusive,

each G_2 and G_3 independently is H or C_1-C_3 alkyl,

G_1 is NH_3 or

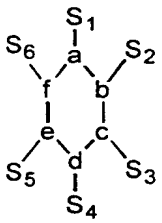


or G_1 is NG_4, where G_4 is



where G_5 and G_6 can be NH, H, or Cl-C_3 alkyl or alkenyl with one or more carbons substituted with a nitrogen; G_1 bears a charge, and G_1 and G_2 do not form a covalently bonded ring structure at pH 7.0.

4. The method of claim 1 wherein the compound has the formula

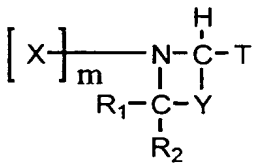


where one or two of the a, b, c, d, e, and f groups is N, and the rest are C, and each S_1-S_6 independently is H or C_1-C_3 alkyl.

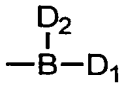
5. The method of claim 1 wherein the compound is a five membered unsaturated ring having two nitrogen atoms.

6. The method of claim 5 wherein the compound is an imidazole ring.

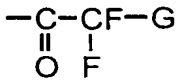
7. The method of claim 1 wherein the compound has the formula



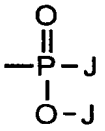
where T is selected from a group of the formula:



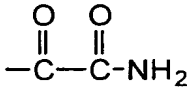
where each D_1 and D_2, independently, is a hydroxyl group or a group which is capable of being hydrolyzed to a hydroxyl group in aqueous solution at physiological pH; a group of the formula:



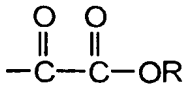
where G is either H, F, or an alkyl group containing 1 to 20 carbon atoms and, optionally, heteroatoms which can be N, S or O; a phosphonate group of the formula:



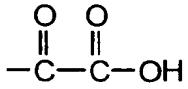
where each J, independently, is any number of C, H, O, S or N atoms in any combination, or O-alkyl, N-alkyl, or alkyl, each O-alkyl, N-alkyl or alkyl containing 1-20 carbon atoms and, optionally, heteroatoms which can be N, S, or O; a group of formula



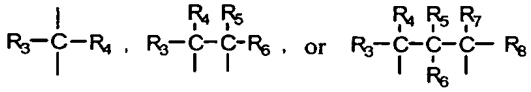
a group of formula



where R is an alkyl, or aryl group and may be substituted or unsubstituted, an alphaketo ester; or a group of formula



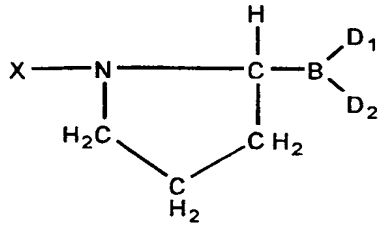
Y is a group of formula:



and each R_1, R_2, R_3, R_4, R_5, R_6, R_7, and R_8 are H;
X is any number of C, H, O, S, or N atoms; and
m can vary from 0 to 20.

8. The method of claim 7 wherein T is a boronate group, a phosphonate group, a cyano group, or a trifluoroalkyl ketone group; each R_1 and R_2 is H, each Y is CH_2-CH_2; each R is independently chosen from the R group of proline and alanine; the inhibitory compound has a binding or dissociation constant to DPP-IV of at least 10^{-9}M; and each D1 and D2 is, independently, F, or D1 and D2 together are a ring containing 1 to 20 carbon atoms, and optionally heteroatoms which can be N, S, or O.

9. The method of claim 7 wherein the compound has the formula



where each D_1 and D_2 is a hydroxyl group; wherein X an amino acid; and wherein C is bonded to B in the L-configuration.

10. The method of claim 9 wherein the compound is Val-boroPro.

11. The method of claim 9 wherein the compound is cyclic Xaa-boroPro.

12. The method of claim 1 wherein the substrate is selected from the group consisting of SDF-1, RANTES, MIP-1, MIP-3, GLP-2, G-CSF, EPO, IL-6, IL-11, IL-8, Substance P, fibronectin, and monomeric fibrin.

13. The method of claim 1 wherein the medical condition is selected from the group consisting of arteriolosclerosis, allergies, inflammation, angiogenesis, cardiogenesis, neoplasm, tumor, cancer, a hepatic disease, an intestinal disease, organ vascularization, and microbial and viral infections.

14. The method of claim 1 wherein the compound is given to the subject by oral administration.

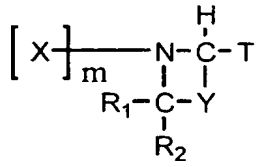
15. The method of claim 1 wherein the compound is given to the subject by parenteral administration.

16. The method of claim 1 wherein the effective amount is in the range of 0.01 mg/kg per day to 100 mg/kg per day.

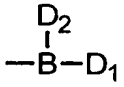
17. A pharmaceutical composition for treating a medical disorder in a subject mediated by chemokine inactivation comprising

a pharmaceutically acceptable carrier; and

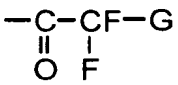
an effective amount of a compound having the formula



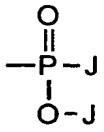
where T is selected from a group of the formula:



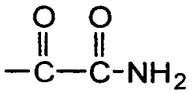
where each D_1 and D_2, independently, is a hydroxyl group or a group which is capable of being hydrolyzed to a hydroxyl group in aqueous solution at physiological pH; a group of the formula:



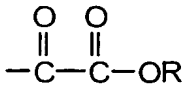
where G is either H, F, or an alkyl group containing 1 to 20 carbon atoms and, optionally, heteroatoms which can be N, S or O; a phosphonate group of the formula:



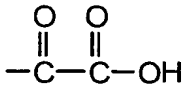
where each J, independently, is any number of C, H, O, S or N atoms in any combination, or O-alkyl, N-alkyl, or alkyl, each O-alkyl, N-alkyl or alkyl containing 1-20 carbon atoms and, optionally, heteroatoms which can be N, S, or O; a group of formula



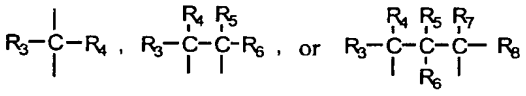
a group of formula



where R is an alkyl, or aryl group and may be substituted or unsubstituted, an alphaketo ester; or a group of formula



Y is a group of formula:



and each R_1, R_2, R_3, R_4, R_5, R_6, R_7, and R_8 are H;

B is boron;

X is any number of C, H, O, S, or N atoms; and

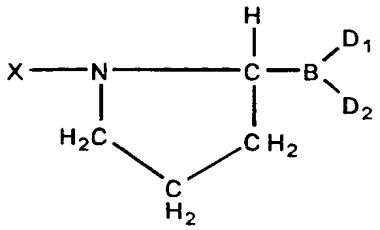
m can vary from 0 to 20.

18. The composition of claim 17 wherein T is a boronate group, a phosphonate group, a cyano group, or a trifluoroalkyl ketone group; each R_1 and R_2 is H, each Y is CH_2-CH_2; each R is independently chosen from the R group of proline and alanine; the inhibitory compound has a binding or dissociation constant to DPP-IV of at least 10^{-9}M; and each D1 and D2 is, independently, F, or D1 and D2 together are a ring containing 1 to 20 carbon atoms, and optionally heteroatoms which can be N, S, or O.

19. A pharmaceutical composition for treating a medical disorder in a subject mediated by chemokine inactivation comprising

a pharmaceutically acceptable carrier; and

an effective amount of a compound having the formula



where each D_1 and D_2 is a hydroxyl group; wherein X an amino acid; and wherein C is bonded to B in the L-configuration.

20. The method of claim 19 wherein the compound is Val-boroPro.

21. The method of claim 19 wherein the compound is cyclic Xaa-boroPro.